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THE GENUS MOLLUGO IN THE GALAPAGOS ISLANDS

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INTRODUCTION

One of the genera early recognized in the midst of a strange insular flora was the genus *Mollugo* of the Carpetweed Family. At Wreck Bay, Chatham Island, the first locality in the Galapagos Islands visited by the Templeton Crocker Expedition of the California Academy of Sciences, this genus was brought to special attention by the discovery of a broad-leaved form and a narrow-leaved form growing on sandy flats near the shore. Henceforth *Mollugo* was watched and collected with critical attention. Until the later days of exploration in the archipelago little seemed to be gained from this special consideration other than new distributional data for species well known, but in the last few weeks in the Galapagos Islands, several forms of *Mollugo* were found which were recognized immediately as different, either as new records for the archipelago or as plants new to science. Because of this special interest taken in the genus, it has been the first in the botanical collections of the Crocker Expedition to be studied critically, the results of the study being given in the following paper. Since a number of forms are described as new it has seemed proper to recount all that is known of the genus in the Galapagos Islands. As a result, the genus will probably come to be counted among the other genera having a notable endemic development in the islands.

The Galapagian species of *Mollugo* constitute a highly specialized group, perhaps most closely related to the North American species

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M. verticillata. From that species, the insular species are readily distinguished by the minutely but definitely tuberculate seeds. Although the island endemics are diverse in habit and floral characters, it is probable that they represent the differentiation and segregation of a single variable prototype, and hence are to be considered closely related. Differentiation would seem to have followed two lines, originating in a glabrous annual form with three and five stamens, the one line developing a subshrubby perennial habit and large flowers, the other line developing a low woody caudex and strikingly glandular herbage. In both lines there is an increase in the number of stamens, approaching or equalling eight, the sum of the five stamens opposite the sepals and the three stamens alternate with the cells of the capsule, two staminal arrangements which occur in the *M. verticillata* type. The geographic separation of the several forms on the different islands has undoubtedly been an important factor in the segregation and maintenance of the specialized developments.

Besides the large collection in the Herbarium of the California Academy of Sciences, made on the Academy expedition to the Galapagos Islands in 1905 and 1906, the writer was privileged through the courtesy of Dr. B. L. Robinson of the Gray Herbarium and Dr. L. R. Abrams of the Dudley Herbarium to borrow the specimens in those institutions. The following symbols are used in citing specimens: C, herbarium of the California Academy of Sciences; D, Dudley Herbarium of Stanford University; G, Gray Herbarium of Harvard University.

KEY TO THE SPECIES

1. PLANTS ANNUAL

- a. Seeds somewhat angular, microscopically ridged on back and reticulate on sides, very small; delicately branched glaucescent plants.....1. *M. Cerviana*
- a. Seeds roundish-reniform or ovate, not angled, finely tuberculate, sometimes ridged on back; plants more robust.
- b. Flowers small, sepals 1-2 mm. long.
 - c. Seeds deeply ridged on back; style 0.5-0.75 mm. long; stamens 5-8.....5. *M. insularis*
 - c. Seeds not deeply ridged on back (somewhat ridged in *M. striata* and *M. gracillima latifolia*); style mostly less than 0.5 mm. long; stamens 3 (or 4).
 - d. Seeds distinctly subreniform; annuals.
 - e. Seeds generally brown and less than 0.5 mm. long; funiculus not prominent...2. *M. gracillima*
 - e. Seeds generally black, 0.5 mm. or more long; funiculus prominent (except in *M. flavescens intermedia*).....3. *M. flavescens*
 - d. Seeds subovate, striate-lineate, about 0.5 mm. long, the funiculus not prominent; probably perennial.....4. *M. striata*
- b. Flowers large, sepals 2-3 mm. long; stamens 8.....7. *M. floriana*

2. PLANTS PERENNIAL

- f. Stems, leaves, pedicels, and sepals not glandular-hairy.
 - g. Flowers 2 mm. long; herbaceous plants with spreading or prostrate stems.
 - h. Stamens 5–8; style 0.5–0.75 mm. long; seeds subreniform, deeply ridged, funiculus prominent.5. *M. insularis*
 - h. Stamens 3; style about 0.33 mm. long; seeds subovate, merely striate-lineate, funiculus short and not prominent.4. *M. striata*
 - g. Flowers 3–4 mm. long (2–2.5 mm. long in var.); twiggy plants with erect stems 1–4 dm. tall; seeds lineate on back.8. *M. Snodgrassii*
- f. Stems, leaves, pedicels, and sepals glandular-hairy.6. *M. Crockeri*

1. *Mollugo Cerviana* (L.) Seringe in DC., Prodr.

1: 392 (1824)

Pharnaceum Cerviana L., Spec. Pl. 1: 272 (1753).

Delicate annual with erect, glabrous stems, 3–15 cm. long; leaves glaucous, linear; flowers 1–3 on divaricate pedicels at the summit of almost leafless branches; sepals 4, 1.5–2 mm. long, elliptic; stamens 4; seeds 0.25–0.33 mm. long, minutely reticulate, somewhat angular.

Collections.—ALBEMARLE ISLAND: edge of lava flow at west base of Tagus Cove Mt., *Howell No. 9588* (C); slopes just east of head of Tagus Cove, *Howell No. 9603* (C). JAMES ISLAND: dunes, Sullivan Bay, *Howell No. 10017* (C). SOUTH SEYMOUR ISLAND: sandy flat back of beach, middle western coast, *Howell No. 9954* (C); *Wheeler, Rose, and Beebe in 1923* (G).

To find this small, widely distributed *Mollugo* so well established on the Galapagos Islands is of more than usual interest. The fact that the species has been found at some stations rarely visited by vessels would have it appear that this is a species not introduced by human agency, but rather one which has not been detected earlier because of its inconspicuous character. Its presence in the Galapagian flora adds a new note of strangeness to a distribution already remarkable.

2. *Mollugo gracillima* Ands., Stock. Akad. Handl. 226 (1854)

Root annual; stems mostly diffusely branched, spreading or suberect, generally 1–4 dm. long, glabrous; leaves 2–5 at nodes, linear or linear-oblongate, to 2 cm. long, 0.5–5 (or 10) mm. wide, acute or mucronulate, rarely obtuse, glabrous, not notably fleshy; flowers 1–4 at nodes; pedicels erect, divaricate or reflexed, 2–7 mm. long, generally sparsely hairy; sepals 4 or 5, 1–2 mm. long, oblong, the center green-veined, the margin whitish; stamens generally 3 (or 4), a little shorter than the sepals; styles short, plumose, 0.2–0.3 mm. long; mature capsule shorter to slightly exceeding the sepals; seeds reniform, generally less than 0.5 mm. long, minutely tuberculate, more or less finely lineate on the rounded back, brown with coppery sheen or rarely blackish, the persistent portion of funiculus not prominent, sometimes almost none.

Mollugo gracillima is one of the common, widely distributed herbs in the lower regions of the archipelago during and shortly following the short rainy period. It is most abundant and characteristic in sandy areas immediately inland from beaches but it also occurs in gravelly soil, or among rocks, or even in clay hollows, in the lower parts of the interior. It is variable in aspect and, to some extent, in technical characters, but it has not appeared best to segregate more than one of these variations taxonomically. Size and shape of leaves, length of pedicels, and size and color of seeds are variable, but the species can be rather readily distinguished from the closely related *M. flavescens* by the usually more diffusely branched spreading habit, by the tendency of the seeds to be lineate on the back, and by the less prominent funiculus. The figure of this species in Andersson's second work on the flora of the Galapagos Islands (Om Galap. Veg. t. 15, f. 3,—1857) was misnamed *M. gracilis*.

KEY TO SUBSPECIES OF *M. gracillima*

- Seeds minutely lineate on back; leaves 0.5–3 mm. wide.....2a. *typica*
 Seeds rather prominently lineate on back; leaves 5–10 mm. wide.....2b. *latifolia*

2a. *Mollugo gracillima typica* Howell, nom. nov.

Mollugo gracillima Ands., Stock. Akad. Handl. 226 (1854).

M. gracilis Ands., Om Galap. Veg. t. 15, f. 3 (1857).

Stems spreading or suberect; leaves linear or linear-oblongate, 0.5–3 mm. wide, generally acute; flowers 1–1.5 mm. long; seeds generally coppery-brown and less than 0.5 mm. long, minutely lineate on the back.

Collections.—ALBEMARLE ISLAND: Villamil, *Stewart No. 1469* (C, G), *Howell No. 8965* (C); Iguana Cove, *Stewart No. 1468* (C, G), *Howell No. 9406* (C); Tagus Cove, *Stewart No. 1470* (C, G), *Howell No. 9511* (C). BARTHOLOMEW ISLAND: crevices of stratified ash, *Howell No. 10061* (C). BINDLOE ISLAND: volcanic sand on north-west coast, *Howell No. 8557* (C). CHARLES ISLAND: *Andersson in 1853* (type collection, G); *Stewart No. 1472* (C); Post Office Bay, *Howell No. 8803* (C); 2 or 3 miles south of Post Office Bay, *Howell No. 9374* (C). CHATHAM ISLAND: Wreck Bay, *Howell No. 8588* (C). INDEFATIGABLE ISLAND: Academy Bay, *Howell No. 9053* (C); Conway Bay, *Howell No. 9877* (C). JAMES ISLAND: James Bay, *Howell No. 9691, 9692* (C); Orchilla Bay, *Baur No. 153*, in part (G); Sullivan Bay, *Howell No. 10022* (C). JERVIS ISLAND: north end, only one plant seen, *Howell No. 9772* (C). NARBOROUGH ISLAND: north side on lava beds, *Stewart No. 1476* (C, G).

Several variants of subspecies *typica* are referred here and deserve mention. On Duncan Island (*Stewart No. 1474*, C, G, and *Howell No. 9839*, C), a form occurs with leaves shorter than usual and oblong-oblongate, and with the flowers glomerate at the nodes on very short pedicels. On South Seymour Island (*Howell No. 9949*, C)

is a form with leaves broader than usual, thus approaching subspecies *latifolia* which occurs on North Seymour Island, but in the southern plant the seeds are not conspicuously lineate. Rarely a plant assumes a perennial aspect, as not infrequently happens to annuals growing in desert regions, but such individuals are undoubtedly annuals affected by fluctuations of the seasonal rainfall.

2b. *Mollugo gracillima latifolia* Howell, subsp. nov.

Ramis patentibus vel prostratis; foliis oblanceolatis vel oblanceolato-spathulatis, 5–10 mm. latis, obtusis; floribus 1.5–2 mm. longis; seminibus fuliginis, dorso striato-lineatis.

Stems spreading or prostrate; leaves oblanceolate or oblanceolate-spathulate, 5–10 mm. wide, obtuse; flowers 1.5–2 mm. long; seeds dark black-brown, 0.5 mm. long, the back striate-lineate.

Collections.—NORTH SEYMOUR ISLAND: marine bluffs, *Crocker* (type, C. A. S. Herb., No. 199033); crevices and shelves of marine bluff, *Howell No. 10001* (C); beach sand, *Howell No. 9980* (C).

The ridges on the backs of the seeds are prominent enough to impress the pattern on the closely enclosing walls of the capsule. In this seed-character *M. gracillima latifolia* resembles *M. verticillata* but differs from that species in the characters of flowers and fruit, and in the dull luster and the tuberculate sides of the seeds. With its broad leaves it might be placed in *M. flavescens* but its seeds are smaller and the funiculus less prominent. A specimen from Brattle Island (*Stewart No. 1471*, C) is old and nearly leafless but the seeds are rather prominently ridged so it is referred here until additional material can be studied.

3. *Mollugo flavescens* Ands., Stock. Akad. Handl. 226 (1854)

Root annual; stems erect or prostrate, rather sparsely branched, 1–3 dm. long, glabrous; leaves at nodes 2–5 (or 9), linear-oblanceolate or spatulate, 0.5–2 cm. long, 0.5–7 mm. wide, obtuse or acute, glabrous, somewhat fleshy-thickened; flowers 3–7 or more at nodes; pedicels generally spreading but some erect or reflexed, 2–4 (or 5) mm. long, mostly glabrous; sepals generally 5, 2 mm. long or nearly, oblong, green-veined with whitish margin, sometimes brownish-tinged; stamens 3 (or 4), slightly shorter than the sepals; style 0.3–0.5 mm. long; capsule slightly shorter than the sepals; seeds turgid-reniform, a little more than 0.5 mm. long, scarcely lineate, black-brown or black, dull or with iridescent sheen, tuberculate, the persistent portion of the funiculus deflexed and prominent (except in subsp. *intermedia*).

As compared to *M. gracillima*, *M. flavescens* and its subspecies have a most limited distribution. The typical subspecies would seem to occur only on Chatham Island and on the north side of Indefatigable Island. The two variants described here as new are confined to one island each, subsp. *angustifolia* being found on James Island and subsp. *intermedia* being found on Charles Island. The species as here defined seems to be a natural entity but one closely related to *M. gracillima*.

KEY TO SUBSPECIES OF *M. flavescens*

- a. Funiculus prominent.
 - b. Stems spreading or prostrate; cauline leaves oblanceolate to oblanceolate-spathulate, mostly twice as long as the pedicels; style about 0.3 mm. long.....3a. *typica*
 - b. Stems strictly erect; cauline leaves linear or linear-oblanceolate, those subtending the upper flowers much-reduced; style 0.3–0.5 mm. long.....3b. *angustifolia*
- a. Funiculus not prominent; stems erect but somewhat spreading; upper leaves reduced but generally equalling the flowers....3c. *intermedia*

3a. *Mollugo flavescens typica* Howell, nom. nov.

Mollugo flavescens Ands., Stock. Akad. Handl. 226 (1854).

Stems spreading or prostrate, 1–2 dm. tall; basal leaves subspathulate 1–2 cm. long, 2–5 mm. wide, cauline leaves oblanceolate to oblanceolate-spathulate, 0.4–1 cm. long, 2–3 mm. wide; pedicels loosely spreading or deflexed, subglabrous; style about 0.3 mm. long; funiculus prominent.

Collections.—CHATHAM ISLAND: *Andersson in 1853* (type collection, G); southwest end, *Baur No. 154* (G); Wreck Bay, *Howell No. 8574* (C). INDEFATIGABLE ISLAND: north side, *Snodgrass and Heller No. 667* (D, G), *Howell No. 9904* (C).

3b. *Mollugo flavescens angustifolia* Howell, subspec. nov.

Caulibus erectis, 2–3.5 dm. altis, ramis paucis, substrictis ascendentibus; foliis basi spathulato-obovatis, caulinis linearo-oblanceolatis, 1–1.5 cm. long, circa 1 mm. latis, supremis brevioribus quam 0.5 cm. longis; pedicellis erectis, glabris, floribus subcongestis; stylo 0.3–0.5 mm. longo; funiculo prominenti.

Stems erect, 2–3.5 dm. tall, the few branches almost strictly ascending; the basal leaves spathulate-obovate but the cauline leaves linear-oblanceolate, 1–1.5 cm. long and 1 mm. or less wide at the lower nodes, the uppermost reduced and mostly less than 0.5 cm. long; pedicels erect, glabrous, the flowers subcongested in small glomerules; style 0.3–0.5 mm. long; funiculus prominent.

Collections.—JAMES ISLAND: in pockets and flats of volcanic sand on nearly barren lava flow, James Bay, *Howell No. 9710* (type, C. A. S. Herb., No. 199031); cinder gravel on lower slopes of high cone at Sullivan Bay, *Howell No. 10032* (C).

3c. *Mollugo flavescens intermedia* Howell, subspec. nov.

Caulibus erectis, subpatentibus, 1.5–2.5 dm. altis; foliis radicalibus spathulatis, basi cuneatis, caulinis oblanceolatis vel linearo-oblanceolatis, 0.5–1.5 cm. longis, 0.5–3 mm. latis; pedicellis patentibus, subglabris; stylo circa 0.3 mm. longo; funiculo brevi et non prominenti.

Stems erect but somewhat spreading, 1.5–2.5 dm. tall; basal leaves spathulate with cuneate base, cauline leaves oblanceolate or linear-oblanceolate, 0.5–1.5 cm. long, 0.5–3 mm. wide; pedicels spreading, subglabrous; style about 0.3 mm. long; funiculus short and not prominent.

Collections.—CHARLES ISLAND: near Black Beach, *Howell* No. 9353 (type, C. A. S. Herb., No. 199030); *Snodgrass and Heller* No. 441 (G).

In appearance and in the technical characters of the seed, this plant is nearly intermediate between *M. flavescens* and *M. gracillima*. The plant is less diffusely branched than in *M. gracillima* and the leaves tend to be narrower than in typical *M. flavescens*. The persistent part of the funiculus is shorter and slenderer than that in most forms of *M. flavescens* but in the size and markings of the seed it is very near typical *M. flavescens*.

4. *Mollugo striata* Howell, spec. nov.

Herba perennis?; caulibus laxe patentibus vel adscendentibus, 1–2 dm. longis, subglabris, viridibus; foliis linearo-oblongatis, 1–2 cm. longis, 1–2 mm. latis, glabris, acutis obtusive; floribus 1–4 nodis; pedicellis patentibus, 1–3 mm. longis, minute pubescentibus; sepalis 5, 1.5–2 mm. longis, virescentibus, oblongis, glabris; staminibus 3, inclusis; stylo circa 0.3 mm. longo; capsula inclusa; seminibus tumidis, subovatis, parte inferiore ventre obliqua, nigris, 0.6–0.7 mm. longis, dorso striatis, lateribus tuberculato-lineatis, partibus persistentibus funiculi brevibus, prope deflexis, non prominentibus.

Root probably perennial; stems laxly spreading or ascending, 1–2 dm. long, subglabrous, green; leaves linear-oblongate, 1–1.8 cm. long, 1–2 mm. broad, glabrous, acute or obtuse; flowers 1–4 at nodes; pedicels spreading, 1–3 mm. long, minutely hairy; sepals 5, 1.5–2 mm. long, greenish, oblong, glabrous; stamens 3, included; style about 0.3 mm. long; capsule equalling the sepals, much-knobbed by the seeds; seeds turgid, subovate with the lower ventral part oblique, black, 0.6–0.7 mm. long, striate on back, tuberculate-lineate on sides, the persistent part of the funiculus short, closely deflexed, not prominent.

Collection.—WENMAN ISLAND: *Stewart* No. 1477 (type, C. A. S. Herb., No. 133519; G).

From the rather poorly prepared specimens on which this species is based, it is not possible to state certainly whether the plant is perennial, but from the character of older stems which bear tufts of new growth near their ends as well as remains of dead twigs of earlier growth, it seems likely that the specimens are from a perennial plant. The character of the flower distinguishes it from *M. insularis*, and the large subovate seed marks it distinct from *M. gracillima* to which it is perhaps most nearly related.

5. *Mollugo insularis* Howell, spec. nov.

Herba annua vel perennis; caulibus 0.5–2 (vel 3) dm. longis, prostratis, glabris, viridibus; foliis oblanceolatis ad linearo-oblongatis, 0.5–2.5 cm. longis, 1–3.5 mm. latis, succulento-crassis, glabris, obtusis acutisve; floribus 3–8 nodis; pedicellis erectis, patentibus vel deflexis, 1.5–3 mm. longis, minute pubescentibus; sepalis 5, albis, virescentibus vel subferrugineis, ellipticis, 1–2 mm. longis, glabris; staminibus 5–8, inclusis; stylo 0.5–0.75 mm. longo; capsula inclusa vel sepalis aequilonga; seminibus subcompressis, nigris, 0.6 mm. longis, dorso costatis, lateribus subcostatis, costis transverse rugosis, partibus persistentibus funiculi prominentibus, deflexis.

Annual or perennial herb; stems 0.5–3 dm. long, prostrate, glabrous, green; leaves oblanceolate to linear-ob lanceolate, 0.5–2.5 cm. long, 1–3.5 mm. broad, fleshy-thickened, glabrous, obtuse or acute; flowers mostly 3–8 at nodes; pedicels erect, spreading, or deflexed, 1.5–3 mm. long, minutely hairy; sepals 5, white, greenish or light brownish, elliptic, 1–2 mm. long, glabrous; stamens 5–8, included; style 0.5–0.75 mm. long; capsule included or equalling the sepals; seeds subreniform, thinnish, black, 0.6 mm. long, deeply ridged on back, shallowly ridged on the sides, the ridges transversely rugose, the persistent part of the funiculus prominent, deflexed.

Collections.—CHARLES ISLAND: Black Beach, *Howell No. 9378* (type, C. A. S. Herb., No. 199029). CHATHAM ISLAND: Sappho Cove, *Stewart No. 1466* (C, G); Bassa Point, *Stewart No. 1473* (C).

This species should be considered a perennial but plants growing in sandy or gravelly soil bloom the first year and do not persist, those growing in crevices of lava becoming perennial and developing a woody caudex similar to that in *M. Crockeri*. The lack of glandular pubescence and the peculiar seeds differentiate it from *M. Crockeri*, and the perennial base, flower, and seed mark it from *M. flavescens* and *M. gracillima*.

6. *Mollugo Crockeri* Howell, spec. nov.

Herba perennis; caulibus ligneis et persistentibus, ramis annuis, late patentibus, 0.5–2 dm. longis, glanduloso-pubescentibus, ferrugineis vel virescentibus; foliis basi tenuiter oblanceolatis, 1–2 cm. longis, 1–3 mm. latis, glanduloso-pubescentibus in margine et infra in media costa, caulinis linearibus, 0.5–2 cm. longis, 0.5–1 mm. latis, dense glanduloso-pubescentibus, subacutis, margine subrevoluto; floribus paucis, 1–3 nodis; pedicellis patentibus vel deflexis, 0.5 cm. longis, glandulosis; sepals 5, oblongo-lanceolatis, 2–3 mm. longis, carneis, exteriore glanduloso-pubescentibus; staminibus 7, inclusis; stylo 0.6–0.7 mm. longo; capsula inclusa; seminibus circa 0.5 mm. longis, reniformibus, lateribus minute tuberculatis, dorso vix lineatis, partibus persistentibus funiculi prominentibus, deflexis.

Perennial herb; lower part of stems woody and persistent, the branches of annual duration, loosely spreading, 0.5–2 dm. long, glandular-hairy, terra-cotta color or greenish; basal leaves slender-ob lanceolate, 1–2 cm. long, 1–3 mm. wide, glandular-hairy on margins and lower side of midrib, cauline leaves of the same color as stems, linear, 0.5–2 cm. long, 0.5–1 mm. wide, densely glandular-hairy, acutish, the margin somewhat revolute; flowers rather few, 1–3 at nodes; pedicels spreading or deflexed, 0.5 cm. long, glandular; sepals 5, oblong-lanceolate, 2–3 mm. long, flesh-color, glandular-hairy outside; stamens 7, included in calyx; style 0.6–0.7 mm. long; capsule included; seeds about 0.5 mm. long, reniform, black, finely tuberculate on sides, scarcely lineate on back, the persistent part of the funiculus prominent and deflexed.

Collection.—JAMES ISLAND: crevices of lava, Sullivan Bay, *Howell No. 10094* (type, C. A. S. Herb., No. 199026).

Mollugo Crockeri with its perennial woody base and highly glandular herbage is one of the most distinctive species of this genus to be described from the Galapagos Islands. It was only found at a single station but there it was locally abundant on a lava flow of fairly recent age. The perennial part of the plant never grows beyond the lava crevices, the herbaceous stems forming a low, loosely

spreading plant above the surface of the flow. It is an honor and pleasure to dedicate this distinctive species to Mr. Templeton Crocker, patron and commander of the latest expedition of the California Academy of Sciences to the Galapagos Islands.

7. *Mollugo floriana* (Rob.) Howell, comb. nov.

Mollugo flavescens var. *floriana* Rob., Proc. Amer. Acad. 38: 143 (1902).

Root annual; stems erect or somewhat loosely branching, 1.5–4 dm. tall, glabrous or finely glandular-pubescent; leaves linear-oblong or linear-oblongate, 1–3 cm. long, 1–3 mm. wide, glabrous or finely glandular-pubescent, herbaceous, 2–5 at a node, obtuse or acute; flowers 2–11 at nodes; pedicels erect or slightly divaricate, 0.4–1 cm. long, glabrous or glandular-pubescent; sepals 5, elliptic-oblong, 2–3 mm. long, glabrous or minutely puberulent, green-veined with white margins; stamens 8, nearly equalling or slightly exceeding the sepals; style 0.7–0.8 mm. long, stigmatic at the upper end; seeds turgid-reniform, nearly black, 0.4–0.7 mm. long, minutely tuberculate on sides, finely lineate on back, the persistent part of the funiculus deflexed and prominent.

The size of the flower and the number of stamens are characters of the species which find a resemblance in *M. Snodgrassii*. But the annual habit, the difference of herbage, and the smaller size of most of the flower parts in *M. floriana* make it amply distinct from *M. Snodgrassii*. This species might be considered an intermediate in relationship between the *M. flavescens*-*M. gracillima* group and *M. Snodgrassii*.

KEY TO SUBSPECIES OF *M. floriana*

Stems, leaves, and pedicels glabrous; seeds a little more than 0.5 mm. long..7a. *typica*
 Stems, leaves, and pedicels more or less finely glandular-pubescent; seeds a
 little less than 0.5 mm. long.7b. *gypsophiloides*

7a. *Mollugo floriana typica* Howell, nom. nov.

Mollugo flavescens var. *floriana* Rob., Proc. Amer. Acad. 38: 143 (1902).

Stems glabrous; leaves oblong-linear, glabrous; pedicels erect, glabrous; sepals glabrous; seeds about 0.6–0.7 mm. long.

Collections.—CHARLES ISLAND: Cormorant Bay, *Baur No. 157* (type, G), *Stewart No. 1467* (C, G).

7b. *Mollugo floriana gypsophiloides* Howell, subspec. nov.

Radice annua; caulibus erectis, subglabris vel glanduloso-pubescentibus; foliis linearo-oblongeolatis; pedicellis erectis, divaricatis, vel raro deflexis, glanduloso-pubescentibus; sepalis sparse et tenuiter glanduloso-pubescentibus, 2–3 mm. longis; staminibus 8; stylo 0.7–0.8 mm. longo; seminibus circa 0.4 mm. longis.

Stems subglabrous or finely glandular-pubescent; leaves linear-oblongate, subglabrous or finely pubescent; pedicels erect, divaricate, or rarely deflexed,

glandular-pubescent, tending to be densely so; sepals sparsely and finely glandular-pubescent; seeds about 0.4 mm. long.

Collections.—DUNCAN ISLAND: crevices of rocks on east side, *Howell No. 9828* (type, C. A. S. Herb., No. 199032); *Stewart No. 1475* (C).

8. *Mollugo Snodgrassii* Rob., Proc. Amer. Acad. 38:
144 (1902)

Suffrutescent perennial; stems erect, those near the base woody, the upper parts jointed and broom-like, green or brownish-tinged, 1–4 dm. tall, glabrous; leaves 2–5 at nodes, linear-ob lanceolate, somewhat fleshy-herbaceous, 0.5–2 cm. long, 0.5–1 mm. wide, obtuse or acute, glabrous; flowers 1–3 at nodes; pedicels generally spreading, 0.5–2 cm. long, glabrous; sepals 5 or 6, 3–4 cm. long, oblong, greenish or brownish-tinged; stamens 7, nearly equalling or exceeding the sepals; style 1–2 mm. long, plumose-stigmatic at the end; mature capsule a little shorter than the sepals, irregular over enclosed seeds; seeds turgid-reniform, about 0.5 mm. long, finely tuberculate on sides and lineate on back, dark brownish-black or black, the persistent portion of the funiculus deflexed and prominent.

Collections.—ALBEMARLE ISLAND: Cowley Bay, *Stewart No. 1478* (C); east side of island 3 miles south of equator, *Ratikan* (C); 5 miles northeast of Webb Cove, *Howell No. 9450* (C); Elizabeth Cove, *Snodgrass and Heller No. 268* (D, G); Tagus Cove Mt., *Howell No. 9523* (C). NARBOROUGH ISLAND: Mangrove Point, *Snodgrass and Heller No. 309* (type collection, D, G).

Mollugo Snodgrassii var. *santacruziana* Christophersen,
Nyt. Mag. Naturvidenskab. 70: 75 (1931)

Cauline leaves to 3 cm. long; pedicels less than 1.5 cm. long; sepals 2–2.5 mm. long (ex char.)

This variety was described from plants collected at Academy Bay, Indefatigable Island, (type, *Christophersen No. 123*, Herb. Mus. Bot. Oslo), but no specimen has been seen from the island which can be referred here. Although the plant is described as a perennial, it would seem that it might be nearer *M. floriana* as the species of *Mollugo* are treated here. The longer leaves, the shorter pedicels, and the smaller flowers are exactly the characters which mark *M. floriana* as distinct from *M. Snodgrassii* when the duration of the plant is not considered. And, as has been pointed out in a discussion of *M. gracillima*, it is not unusual in deserts with a uniformly mild climate for an annual species to assume a temporary perennial aspect if the sporadic rains of the region are properly spaced. It is of particular interest that the very specimens of *M. gracillima* which provoked the earlier remark were plants with a perennial aspect collected at Academy Bay. It is noteworthy in this regard to mention that the vicinity of Academy Bay is one of the few localities in the lowlands of the Galapagos Islands where

truly desert conditions do not prevail, for here the more luxuriant development of the vegetation indicates that moisture borne on the southeast trade winds during the long dry period is precipitated not only at higher elevations in the interior but also occasionally in the lowlands. Intermittent but properly spaced rainfall during the dry season would undoubtedly produce the perennial effect that is noted. In connection with the distribution of *Mollugos* in the archipelago, the occurrence of a variety of *M. Snodgrassii* is scarcely to be expected on the south side of Indefatigable Island, but the occurrence there of *M. floriana* might have been anticipated since Academy Bay lies between the station for *M. floriana* on Charles Island and the station for *M. floriana gypsophiloides* on Duncan Island.